

REMARKS

The Applicants have considered the Office Action mailed on July 10, 2006, and the cited references.

Claims 1-26 were pending in the application, of which Claims 1, 7, 12, 19, and 23-26 are independent claims. Claims 23-26 have been withdrawn from consideration. Claims 1-3, 6-7, 10-13, and 17-18 were rejected under 35 U.S.C. § 102 and Claims 4-5, 8-9, 14-16, and 19-22 were rejected under 35 U.S.C. § 103. In response, certain claims have been amended, certain claims have been cancelled, and new claims have been added to the application.

The claims as now amended clarify the subject matter for which a patent is sought. Unless stated otherwise, the amendment and cancellation of claims should not be considered an acquiescence to the outstanding rejections.

Reconsideration and further examination are respectfully requested.

Claim Rejections Under Section 102

Claims 1-3, 6-7, 10-13, and 17-18 were rejected under 35 USC § 102(b) as being anticipated by Carter (U.S. 5,360,000). In response, certain claims have been amended, other claims cancelled, and new claims added to the application to clarify the inventive subject matter.

The Applicants' Specification discloses a pneumatic near-balanced differential pressure valve. As described with reference to FIG. 4, the operation of the valve is determined by the position of a diaphragm. When closed, the diaphragm is seated against a nozzle or end of a gas passageway, which is pressured in the steady-state condition. The opposite side of diaphragm interfaces with a control chamber, such as a timing gas chamber.

The diaphragm is responsive to the pressure in the control chamber. When the control chamber is pressurized, the diaphragm closes the gas passageway. As the pressure in the control chamber is reduced, the pressure in the gas passageway overcomes the pressure exerted by the control chamber and the valve opens to allow gas to flow from the gas passageway and exit the valve. The Applicants describe a pneumatic valve that does not require bias springs or other mechanical assistance to release the diaphragm from the nozzle.

In contrast, Carter discusses a pneumatic demand valve that requires a bias spring. The operation of the Carter valve is discussed with reference to Figs. 5 and 6. In Carter's device "it is necessary to position bias spring 118a in surrounding relationship to the annular wall 120a so as to exert an upward biasing force against slave diaphragm 114a." (Col. 6, ll. 43-46 (emphasis added).) Without the bias spring (118a), the Carter device would not function correctly, if at all, because Carter's diaphragm may never unseat from the nozzle head.

Claims 1, 3 and 6 have been cancelled in favor of new Claim 27. Independent Claims 1, 7, 12, and 23-25 have been amended to recite that the valve operated "without mechanical assistance." The dependent claims incorporate the amended claim limitations from the independent claims. As such, Claims 2, 7, 10-13, and 17-18 are distinguishable over Carter and are in condition for allowance. Indeed, by requiring a bias spring, Carter teaches away from the claimed invention.

Furthermore, the Applicants traverse the assertions in the Office Action that the size of the nozzle and the forces are a mere design choice based on some predetermined parameters suggested by Carter. Carter does not suggest any design parameters for the nozzle or diaphragm. Those with knowledge of Carter would simply chose a convenient nozzle diameter and apply a bias spring to balance the forces.

As particularly described and claimed by the Applicants, the size of the interface between the nozzle and the diaphragm is computed so as to exert sufficient force on the diaphragm to unseat the diaphragm in response to a reduction in pressure in the control chamber, without requiring mechanical assistance. This aspect of the invention is disclosed at least on page 11, lines 4-7 of the Applicants' Specification as originally filed. Because Carter offers no such teachings, the amendments to the claims should not be considered an acquiescence to the rejections, and the Applicants reserve the right to seek the subject matter in a later application.

Reconsideration of the rejections under 35 U.S.C. § 102 is respectfully requested.

Claim Rejection Under Section 103

Claims 4-5, 8-9, 14-16, and 19-22 were rejected under 35 USC § 103(a) as being unpatentable over Carter (U.S. 5,360,000) in view of Danon (U.S. 5,348,001). These rejections are traversed.

The Applicants describe and claim a gas delivery valve that includes a filter element in the gas delivery path. In other words, gas passes through the filter element before exiting the valve. In particular, the filter element is disposed in a nozzle that interfaces with a diaphragm in a differential pressure valve. The use of a filter in an oversized nozzle was found to be advantageous in the Applicants' device, as described in the Specification.

The Office Action cites Danon as employing a sintered bronze filter. The Office fails to note, however, that the Danon filter is disposed in a gas inlet to the valve. The use of a filter element to keep contaminants out of a gas valve are well-known in the prior art. Danon does not discuss a filter in the exit flow of gas or suggest a need for such a filter.

The use of a filter element within a gas delivery passageway is not believed to be known in the prior art. Neither Carter nor Danon, either alone or in combination, suggest otherwise.

The use of a filter element interior to a differential pressure valve is also suggested by Carter or Danon, either alone or in combination.

Independent Claims 19 and 26 have been amended to recite "a nozzle disposed in the gas flow path, wherein the gas flow through the nozzle exits through a filter element." The dependent claims incorporate the amended claim limitations from the independent claims. As such, Claims 4-5, 8-9, 14-16, and 19-22 are distinguishable over Carter in view of Danon and are in condition for allowance.

Reconsideration of the rejections under 35 U.S.C. § 103 is respectfully requested.

New Claims

New Claims 27-30 have been added to the application. Independent Claims 27 and 30 are independent claims. As Claim 30 claims a method of manufacturing the valve of Claim 27, it is considered withdrawn, but is added in the event of rejoinder of claims.

Independent Claim 27 is patentable for the same reasons given above. It is supported by at least FIG. 4 as described in the Applicants' Specification. No new matter is being added to the application.

Acceptance and allowance of new Claims 27-30 are respectfully requested.

Conclusion

The amended claims are now in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to telephone the Applicants' attorney (781-239-8131) to facilitate prosecution of this application.

Respectfully submitted,

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Date December 11, 2006

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